UT20736-07414

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
http://www.epa.gov/region08

OCT 0 1 2015

Ref: 8ENF-UFO

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Rodrigo Jurado, Regulatory Compliance Specialist
Petroglyph Operating Company, Inc.
4116 West 3000 South Ioka Lane
P.O. Box 2653
Roosevelt, Utah 84066

Re: Underground Injection Control (UIC)
Change in Maximum Allowable Injection Pressure
Ute Tribal 7-15 Well
EPA Well No. UT20736-07414
EPA Permit No. UT20736-10000
API # 43-013-31797
Antelope Creek Oil Field
Duchesne County, Utah

Dear Mr. Jurado:

On August 3, 2015, the Environmental Protection Agency (EPA) received a letter from Petroglyph Operating Company, Inc. (Petroglyph) requesting a proposed change of the maximum allowable surface injection pressure (MAIP) for the above-referenced well. The proposed change in MAIP included results from a step rate test performed from July 17, 2015 to July 26, 2015. The results of the step rate test indicated a fracture gradient of 0.827 pounds per square inch per feet (psi/ft). The EPA has reviewed your request and concurs with the determined fracture gradient value.

Pursuant to Part II, Section C.5.b of the above referenced permit, the EPA hereby revises the MAIP for the Ute Tribal 7-15 injection well to not exceed **1600** psig. The determination is based on the following calculation, rounded down to an integer of five:

$$MAIP = [FG - (0.433)(SG)]*Depth$$

Where:
FG = 0.827 psi/ft (from the step rate test)
SG = 1.002 (the average specific gravity from annual fluid analysis results)
Depth = 4080 ft (top perforation depth KB)

If in the future, the well is perforated at any depth more shallow than the current top perforation of 4080 feet, the MAIP must be recalculated to reflect to the shallowest perforated depth.

	GREEN	BLUE	OBI
TAB		1	

Failure to comply with a UIC permit or the UIC regulations found at 40 C.F.R. Parts 144 and 146 constitute one or more violations of the Safe Drinking Water Act, 42 U.S.C. § 300h-2. Such non-compliance may subject you to formal enforcement by the EPA, as codified at 40 C.F.R. Part 22.

If you have any questions concerning this letter, you may contact Gary Wang of my staff at (800) 227-8917, extension 312-6469 or at (303) 312-6469. Please direct all correspondence to the attention of Gary Wang at Mail Code 8ENF-UFO.

Sincerely,

Arturo Palomares, Director
Water Technical Enforcement Program
Office of Enforcement, Compliance
and Environmental Justice

cc: Shaun Chapoose, Chairman, Uintah & Ouray Business Committee
Edred Secakuku, Vice-Chairman, Uintah & Ouray Business Committee
Reannin Tapoof, Executive Assistant, Uintah & Ouray Business Committee
Brad Hill, Utah Division of Oil, Gas and Mining

7009 3410 0000 2600 9210

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

For delivery information visit our website at www.usps.com®

OFFICIAL USE

Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total I	

Postmark Here

Sent To Rodrigo Jurado, Reg. Comp. Specialist
Petroglyph Operating Company, Inc.
Street, or PO B 4116 West 3000 South Ioka Lane
P.O. Box 2653
City, St Roosevelt, UT 84066

PS Form 3800, August 2006 See Reverse for Instructions

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

OCT 02 2015

Rodrigo Jurado, Reg. Comp. Specialist
Petroglyph Operating Company, Inc.
4116 West 3000 South Ioka Lane
P.O. Box 2653
Roosevelt, UT 84066

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Rodrigo Jurado ☐ Agent ☐ Addressee

B. Received by (Printed Name) C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

ROOSEVELT UT 84066 OCT 6 2015 USPS

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number *(Transfer from service label)* 7009 3410 0000 2600 9210

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-154

UIC ENFORCEMENT ROUTING AND TRANSMITTAL SLIP: UT20736-07414 Petroglyph revised MAIP

		Mailcode	Initials	Date
Gary Wang *(Writer, UIC Enforcement)*	*Phone: 303-312-6469*	8ENF-UFO	GW	9/18/15
~~**Joan Detty**~~ *(Administrative)* OSinJones	*Proof*		OJ	9/21/15
Bruce Suchomel *(UIC Permitting)*	*Concurrence*	8PO-W-UIC	BRS	9/22/15
Kimberly Pardue-Welch *(UIC Enforcement, Team Leader)*		8ENF-UFO	KPW	9/21/15
Art Palomares *(Director, Water Technical Enforcement Program)*	***Signature***	8ENF	AP	9/25/15
Joan Detty *(Administrative)*	*- (Mail & Fax) -*		JD	10/1/15
Writer	*file documents*	8P-R		

☐ Action	☐ File	☐ Note and Return
☐ Approval	☐ For Clearance	☐ Per Conversation
☐ As Requested	☐ For Correction	☐ Prepare Reply
☐ Circulate	☐ For Your Information	☐ See Me
☐ Comment	☐ Investigate	☒ Signature
☐ Coordination	☐ Justify	

REMARKS

Petroglyph has performed a Step Rate test and is requesting revision of the MAIP for the Tribal Ute #7-15 well.

G:\UFO\UIC\UIC VITAL RECORDS\UIC CORRESPONDENCE\FY15\Petroglyph\UT20736-07414 - (2015.09.16) MAIP change.docx

Before signature by the appropriate official, this enforcement matter requires confirmation by TEP and/or LEP staff that either: 1) it contains no information claimed to be Confidential Business Information (CBI); or 2) any such information has been redacted from any version of the document which may be distributed to anyone other than U.S. government personnel or the party claiming the information to be CBI. In addition, if there is a CBI claim, that fact must be noted prominently on the first page of the document. Initialing the slip above constitutes such confirmation by the ECEJ staff assigned to this matter.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
http://www.epa.gov/region08

Ref: 8ENF-UFO

CONCURRENCE COPY

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Rodrigo Jurado, Regulatory Compliance Specialist
Petroglyph Operating Company, Inc.
4116 West 3000 South Ioka Lane
P.O. Box 2653
Roosevelt, Utah 84066

Re: Underground Injection Control (UIC)
Change in Maximum Allowable Injection Pressure
Ute Tribal 7-15 Well
EPA Well No. UT20736-07414
EPA Permit No. UT20736-10000
API # 43-013-31797
Antelope Creek Oil Field
Duchesne County, Utah

Dear Mr. Jurado:

On August 3, 2015, the Environmental Protection Agency (EPA) received a letter from Petroglyph Operating Company, Inc. (Petroglyph) requesting a proposed change of the maximum allowable surface injection pressure (MAIP) for the above-referenced well. The proposed change in MAIP included results from a step rate test performed from July 17, 2015 to July 26, 2015. The results of the step rate test indicated a fracture gradient of 0.827 pounds per square inch per feet (psi/ft). The EPA has reviewed your request and concurs with the determined fracture gradient value.

Pursuant to Part II, Section C.5.b of the above referenced permit, the EPA hereby revises the MAIP for the Ute Tribal 7-15 injection well to not exceed **1600** psig. The determination is based on the following calculation, rounded down to an integer of five:

$$MAIP = [FG - (0.433)(SG)]*Depth$$

Where:
FG = 0.827 psi/ft (from the step rate test)
SG = 1.002 (the average specific gravity from annual fluid analysis results)
Depth = 4080 ft (top perforation depth KB)

If in the future, the well is perforated at any depth more shallow than the current top perforation of 4080 feet, the MAIP must be recalculated to reflect to the shallowest perforated depth.

CONCUR	Author + ext. (print)	Initial + last name	KPW	BRS						
	GW	Office code	8ENF-W	8P-W-UIC						
	6469	Date	9/21/15	9/22						

Failure to comply with a UIC permit or the UIC regulations found at 40 C.F.R. Parts 144 and 146 constitute one or more violations of the Safe Drinking Water Act, 42 U.S.C. § 300h-2. Such non-compliance may subject you to formal enforcement by the EPA, as codified at 40 C.F.R. Part 22.

If you have any questions concerning this letter, you may contact Gary Wang of my staff at (800) 227-8917, extension 312-6469 or at (303) 312-6469. Please direct all correspondence to the attention of Gary Wang at Mail Code 8ENF-UFO.

Sincerely,

Arturo Palomares, Director
Water Technical Enforcement Program
Office of Enforcement, Compliance
and Environmental Justice

cc: Shaun Chapoose, Chairman, Uintah & Ouray Business Committee
Edred Secakuku, Vice-Chairman, Uintah & Ouray Business Committee
Reannin Tapoof, Executive Assistant, Uintah & Ouray Business Committee
Brad Hill, Utah Division of Oil, Gas and Mining

bcc: Randy Brown (8P-TA)
Kimberly Pardue-Welch (8ENF-W)
Gary Wang (8ENF-UFO)

Cc addresses:

Shaun Chapoose, Chairman
Uintah & Ouray Business Committee
P.O. Box 70
Fort Duchesne, Utah 84026

Edred Secakuku, Vice-Chairman
Uintah & Ouray Business Committee
P.O. Box 70
Fort Duchesne, Utah 84026

Reannin Tapoof, Executive Assistant
Uintah & Ouray Business Committee
P.O. Box 70
Fort Duchesne, Utah 84026

Brad Hill
Utah Division of Oil, Gas and Mining
P.O. Box 145801
Salt Lake City, Utah 84114

Step Rate Test

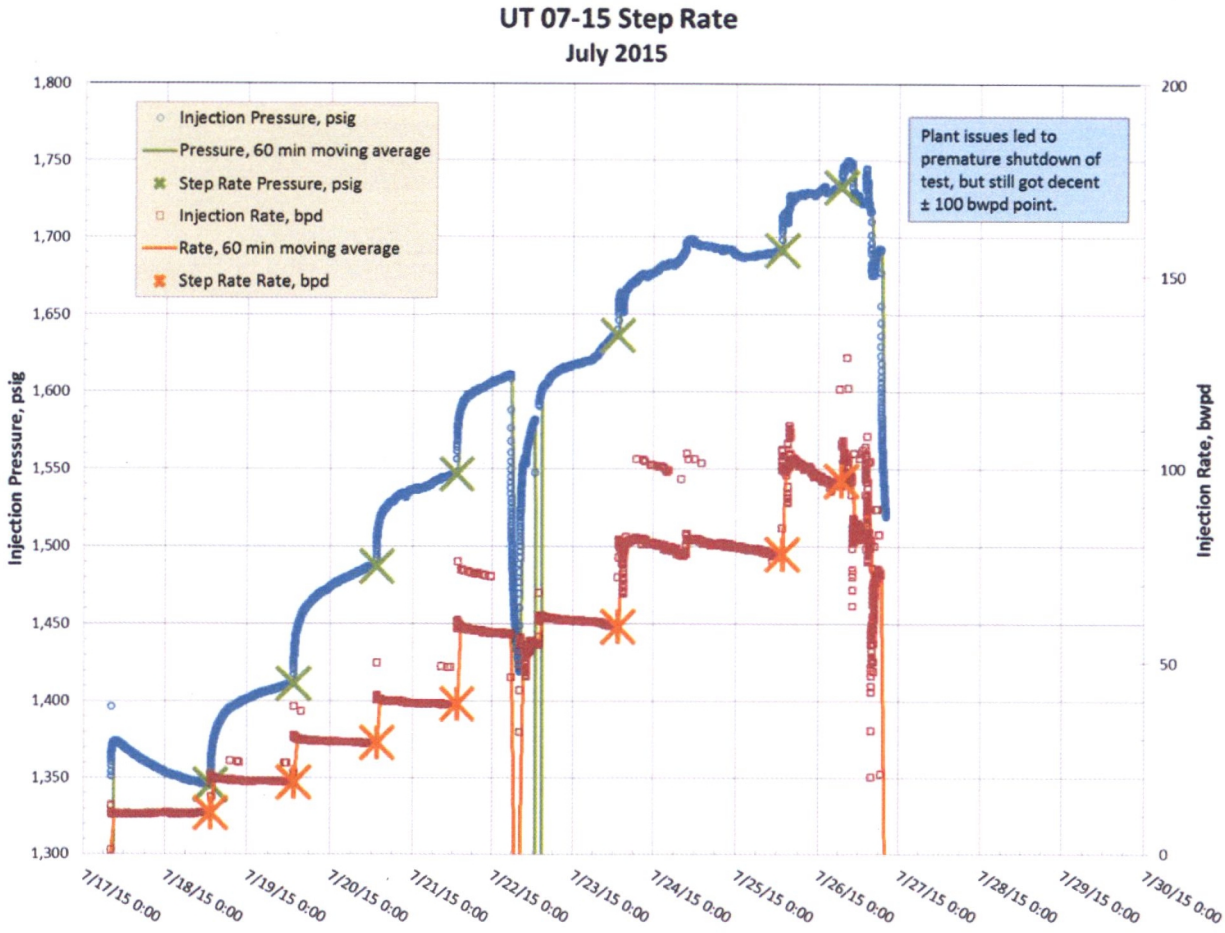
UT 07-15 Injector

Antelope Creek Field
Duchesne County, UT
EPA Permit #: UT2736-07414

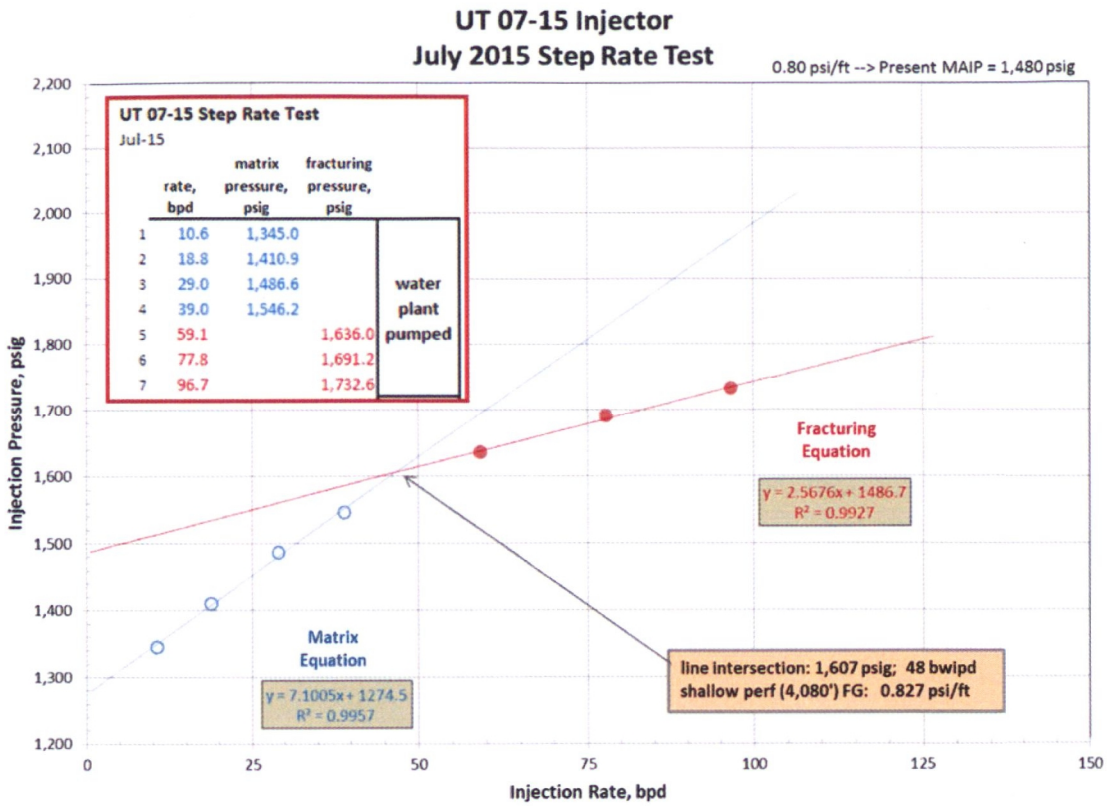
On July 17, 2015, Petroglyph Energy began a step rate test on the UT 07-15 Injector. This well has a Maximum Allowable Injection Pressure (MAIP) of 1,480 psig which was set based on a 0.80 psi/ft fracturing gradient to the top perforation at 4,080'. This step rate was run to determine the actual fracturing gradient.

The step rate test was performed from July 17-July 26, 2015. We have good digital data points with matrix and fracturing lines having $R^2 > 0.99$, indicating a good test. In general, each step was 24 hours in length, although we extended a couple tests to 48 hours, when we had interruptions in the test. Our final fracturing point, while agreeing with the data set, was cut short due to plant problems.

A Cartesian plot of the digitally recorded Halliburton meter data (1 minute increments):



The Step Rate chart:



The resultant step rate plot indicates a fracturing point intersection at:

1,607 psig
48 bwipd
FG: 0.827 psi/ft - to the top perf

Based on this test, we believe the MAIP should be adjusted upwards to 1,607 psig.

A spreadsheet with the data and graphs is enclosed.

Kevin Dickey
VP Operations
Petroglyph Energy, Inc.
960 Broadway Ave, Boise, ID 83706
o. 208.685.7654
m. 208.841.5354

EPA's Verificaiton of Step Rate Test Analysis

Well name: Ute Tribal 07-15
Permit number: UT20736-07414

Instructions:

1) Enter verified Rate and Pressure data into table

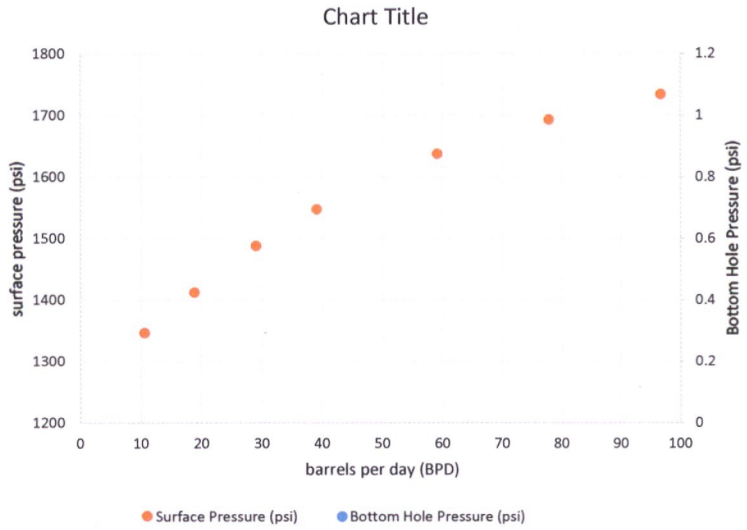
2) Look at scatter plot to left and determine rate step where formation fracture seems to occur.

a) If this point is obvious, enter the m and b values from trendlines on corresponding chart below into table (cell D18) to solve for Pfp.

b) If this point is not obvious, enter the two values for R2 off the charts that represent possible data fits in column L. Look at the R2 summary table to determine which results in the best fit (Sum R2 value closest to 2.0). Then enter the m and b values from the trendlines on table to determine which results in the best fit Sum R2 value

3) Pfp value is automatically entered onto SRT analysis tab. Enter sg, Depth to top perf, and ISIP on that tab to solve for FG (and MAIP).

Rate (bpd)	Bottom Hole Pressure (psi)	Surface Pressure (psi)
10.6		1345
18.8		1410.9
29		1486.6
39		1546.2
59.1		1636
77.8		1691.2
96.7		1732.6



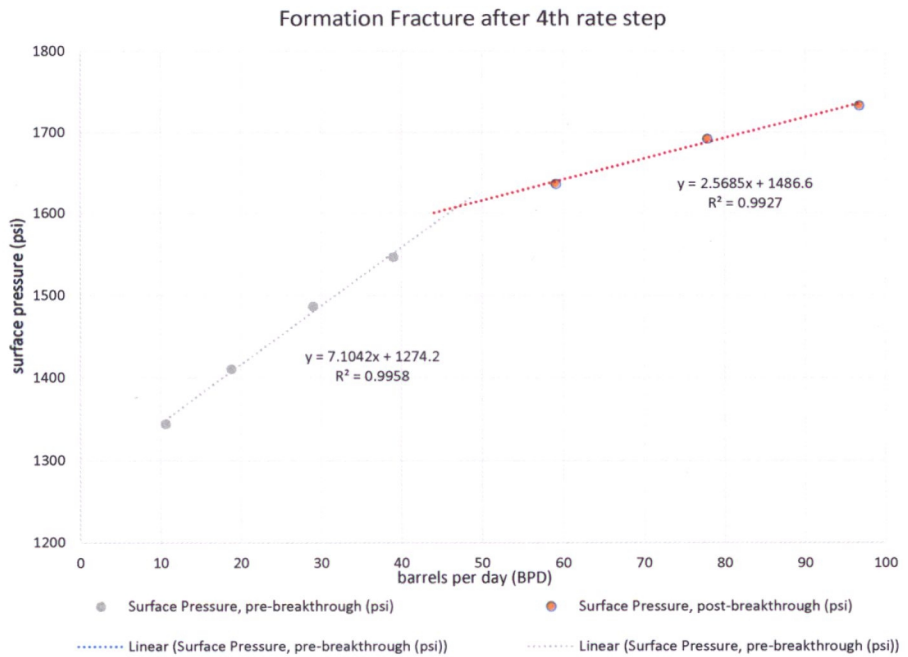
Resulting Formation Parting Pressure

For the graph that results in the best fit (Sum R^2 value closest to 2.0), Enter the following values from the two linear equations to solve for Pfp.
(linear equations in form y = mx + b)

m_1 =	7.1042
b_1 =	1274.2
m_2 =	2.5685
b_2 =	1486.6

P_{fp} = 1607 psi

BPD @ P_{fp} based on pre-breakthrough trendline	47.0
BPD @ P_{fp} based on post-breakthrough trendline	47.0



Step Rate Test (SRT) Analysis

Date: 09/18/2015

Operator: **Petroglyph**

Well: **Ute Tribal 07-15**

Permit #: **UT20736-07414**

Surface fracture pressure (P_{fp})	1607	*psi*
Depth to top perf (D_{perf})	4080	*feet*

$$FG = \frac{P_{fp}}{D_{perf}} + 0.433$$

Fracture Gradient (FG)	0.827	*psi/feet*
Specific Gravity (SG)	1.002	*g/cc*

$$MAIP = FG_{\square} - (0.433 * SG]) * D_{inj}$$

Depth to Injection Zone (D_{inj})	4080	*feet*
Maximum Allowable Injection Pressure, calculated to top perforation (MAIP)	1604	*psig*
Maximum Allowable Injection Pressure, calculated to top perforation (MAIP),	**1600**	*psig*

Specific Gravity from annual monitoring reports	
FY2014	1.005
FY2013	1.002
FY2012	0.999
FY2011	1.000
FY2010	1.005
FY2009	1.001
FY2008	1.004
FY2007	1.000
AVG	**1.002**

Inspection Report For Well: UT20736 - 07414

U.S. Environmental Protection Agency
Underground Injection Control Program, 8ENF-T
999 18th Street, Suite 300, Denver, CO 80202-2466

This form was printed on 9/24/2013

INSPECTOR(S): Lead: Roberts, Sarah — Date: 10/12/2013
Others: Ajayi, Christopher — Time: 9:24 (am) / pm

OPERATOR (only if different): _____

REPRESENTATIVE(S): Chad Stevinson

PRE-INSPECTION REVIEW

Petroglyph Operating Company, Inc

Well Name:	Ute Tribal 7-15		
Well Type:	Enhanced Recovery (2R)		
Operating Status:	AC (ACTIVE) as of 7/12/2007		
Oil Field:	Antelope Creek (Duchesne)		
Location:	SWSE S7 T5S R3W		
Indian Country:	X, Uintah and Ouray		
Last Inspection:	8/29/2011	***Allowable Inj Pressure:***	1480 /
Last MIT:	Pass 12/23/2011	***Annulus Pressure From Last MIT:***	1010

BLACK = POSSIBLE VIOLATION GREY = DATA MISSING

INSPECTION TYPE: (Select One)
- ☐ Construction / Workover
- ☐ Plugging
- ☐ Post-Closure
- ☐ Response to Complaint
- ☒ Routine
- ☐ Witness MIT
- ☐ Other

ICIS Entered
Date 12/31/13
Initials DB

OBSERVED VALUES:

Tubing Gauge:	☒ Yes ☐ No	Pressure: U: 1389 / L: ____ psig Gauge Range: Scada psig		Gauge Owner:	☐ EPA ☒ Operator
Annulus Gauge:	☒ Yes ☐ No	Pressure: 0 psig Gauge Range: opened psig		Gauge Owner:	☒ EPA ☐ Operator
Bradenhead Gauge:	☐ Yes ☐ No	Pressure: ____ psig Gauge Range: ____ psig		Gauge Owner:	☐ EPA ☐ Operator
Pump Gauge:	☐ Yes ☐ No	Pressure: ____ psig Gauge Range: ____ psig		Gauge Owner:	☐ EPA ☐ Operator
Operating Status: (Select One)	☒ Active ☐ Being Reworked	☐ Not Injecting ☐ Production	☐ Plugged and Abandoned ☐ Under Construction		

U2 Entered
Date 12/17/13
Initial

See page 2 for photos, comments, and site conditions.

GREEN	BLUE	CBI
	1	

Inspection Report For Well: UT20736 - 07414 (PAGE 2)

PHOTOGRAPHS: ☐ Yes ☒ No List of photos taken: _____

Comments and site conditions observed during inspection: _____

GPS: GPS File ID: _____

Signature of EPA Inspector(s): _____ _____ _____

☐ Data Entry ☐ Compliance Staff ☐ Hard Copy Filing

NOTICE OF INSPECTION

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII, 999 18TH STREET - SUITE 500
DENVER, COLORADO 80202-2405

Date: 12/16/13
Hour: 8:00a

Notice of inspection is hereby given according to Section 1445(b) of the Safe Drinking Water Act (42 U.S.C. §300f et seq.).

Firm Name: Petroglyph Operating, Inc.

Firm Address: Roosevelt, UT, Antelope Creek Oil Field

REASON FOR INSPECTION:

For the purpose of inspecting records, files, papers, processes, controls and facilities, and obtaining samples to determine whether the person subject to an applicable underground injection control program has acted or is acting in compliance with the Safe Drinking Water Act and any applicable condition of permit or rule authorization.

SECTION 1445(b) of the SAFE DRINKING WATER ACT is quoted below:

Section 1445(b)(1): Except as provided in Paragraph (2), the Administrator, or representatives of the Administrator duly designated by him, upon presenting appropriate credentials, and a written notice to any supplier of water or other person subject to (a), or person subject (A) a national primary drinking water regulation prescribed under Section 1412(B) an applicable Underground Injection Control Program, or (C) any requirement to monitor an unregulated contaminant pursuant to subsection (a), or person in charge of any of the property of such supplier or other person referred to in clause (A), (B), or (C), is authorized to enter any establishment, ... facility, or other property of such supplier or other person in order to determine whether such supplier or other person has acted or is acting in compliance with this title, including for this purpose, inspection, at reasonable times, of records, files, papers, processes, controls, and facilities, or in order to test any feature of a public water system, including its raw water source. The Administrator or the Comptroller General (or any representative designated by either) shall have access for the purpose of audit and examination to any records, reports, or information of a grantee which are required to be maintained under subsection (a) or which are pertinent to any financial assistance under this title.

Sarah Roberts
Inspector's Name & Title (Print)

Inspector's Signature

EPA R8 3560-1 (8-89)

Original - Regional Office Copy
Yellow Copy - Operator Copy

OMB No. 2040-0042 Approval Expires 11/30/2014

United States Environmental Protection Agency
Washington, DC 20460

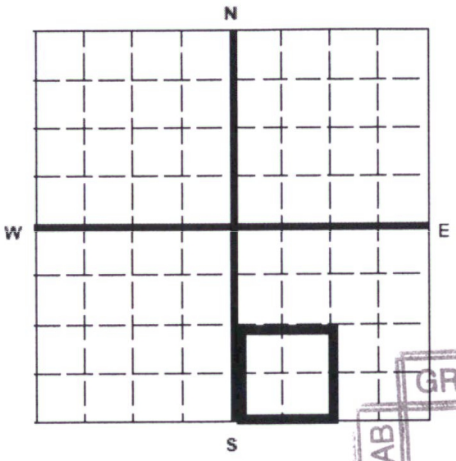
EPA

ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

Name and Address of Existing Permittee
Petroglyph Operating Company, Inc. 2258
P.O. Box 7608
Boise, Idaho 83709

Name and Address of Surface Owner
Ute Indian Tribe
P.O. Box 70
Ft. Duchesne, Utah, 84026

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Utah	Duchesne	UT2736-07414

Surface Location Description
___ 1/4 of ___ 1/4 of SW 1/4 of SE 1/4 of Section 7 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 660 ft. frm (N/S) S Line of quarter section
and 1980 ft. from (E/W) E Line of quarter section.

U2 Entered
Date 3/29/17
Initial JB

WELL ACTIVITY
- [ ] Brine Disposal
- [X] Enhanced Recovery
- [ ] Hydrocarbon Storage

TYPE OF PERMIT
- [ ] Individual
- [X] Area

Number of Wells 111

Lease Name Ute Indian Tribe Well Number UTE TRIBAL 07-15

GREEN BLUE CBI TAB 2

		INJECTION PRESSURE		TOTAL VOLUME INJECTED		TUBING -- CASING ANNULUS PRESSURE (OPTIONAL MONITORING)	
MONTH	YEAR	AVERAGE PSIG	MAXIMUM PSIG	BBL	MCF	MINIMUM PSIG	MAXIMUM PSIG
January	16	1497	1520	505		0	0
February	16	1554	1561	1069		0	0
March	16	1531	1570	1056		0	0
April	16	1464	1515	905		0	0
May	16	1504	1561	977		0	0
June	16	1481	1535	816		0	0
July	16	1513	1526	876		0	0
August	16	1482	1525	783		0	0
September	16	1465	1525	786		0	0
October	16	1415	1456	834		0	0
November	16	1438	1488	917		0	0
December	16	1470	1494	1024		0	0

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibliity of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Chad Stevenson, Water Facilities Supervisor		03/21/2017

EPA Form 7520-11 (Rev. 12-11)

Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

multi-chem®
A HALLIBURTON SERVICE

Units of Measurement: **Standard**

Water Analysis Report

Production Company:	**PETROGLYPH OPERATING CO INC - EBUS**	Sales Rep:	**James Patry**
Well Name:	**UTE TRIBAL 07-15 INJ, TT, DUCHESNE**	Lab Tech:	**Kaitlyn Natelli**
Sample Point:	**Well Head**		
Sample Date:	**1/6/2017**		
Sample ID:	**WA-345310**		

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics

Test Date:	**1/25/2017**
System Temperature 1 (°F):	**300**
System Pressure 1 (psig):	**2000**
System Temperature 2 (°F):	**130**
System Pressure 2 (psig):	**50**
Calculated Density (g/ml):	**0.9989**
pH:	**6.80**
Calculated TDS (mg/L):	**1873.18**
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	**80.00**
H_2S in Gas (%):	
H2S in Water (mg/L):	**10.00**
Tot. SuspendedSolids(mg/L):	
Corrosivity(LanglierSat.Indx)	**0.00**
Alkalinity:	

Analysis @ Properties in Sample Specifics

Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	**0.00**	Chloride (Cl):	**73.00**
Potassium (K):	**2.75**	Sulfate (SO_4):	**100.00**
Magnesium (Mg):	**23.75**	Bicarbonate (HCO_3):	**854.00**
Calcium (Ca):	**46.40**	Carbonate (CO_3):	
Strontium (Sr):	**0.77**	Hydroxide(HO):	
Barium (Ba):	**1.53**	Acetic Acid (CH_3COO)	
Iron (Fe):	**445.91**	Propionic Acid (C_2H_5COO)	
Zinc (Zn):	**314.85**	Butanoic Acid (C_3H_7COO)	
Lead (Pb):	**0.01**	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Ammonia NH_3:		Fluoride (F):	
Manganese (Mn):	**0.41**	Bromine (Br):	
Aluminum (Al):	**1.33**	Silica (SiO_2):	**9.80**
Lithium (Li):	**2.60**	Calcium Carbonate ($CaCO_3$):	
Boron (B):	**0.62**	Phosphates (PO_4):	**12.35**
Silicon (Si):	**4.58**	Oxygen (O_2):	

Notes:

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
130.00	50.00	0.03	1.51	0.83	0.77	3.99	9.40	3.07	256.91	0.00	0.00	0.00	0.00	0.00	0.00	11.50	10.42
149.00	267.00	0.11	6.21	0.73	0.74	3.98	9.40	3.19	259.67	0.00	0.00	0.00	0.00	0.00	0.00	11.28	10.42
168.00	483.00	0.23	12.66	0.66	0.71	4.04	9.40	3.34	262.93	0.00	0.00	0.00	0.00	0.00	0.00	11.14	10.42
187.00	700.00	0.37	18.61	0.61	0.69	4.12	9.40	3.49	265.77	0.00	0.00	0.00	0.00	0.00	0.00	11.03	10.42
206.00	917.00	0.52	23.84	0.57	0.67	4.21	9.40	3.64	268.24	0.00	0.00	0.00	0.00	0.00	0.00	10.94	10.42
224.00	1133.00	0.68	28.24	0.56	0.66	4.33	9.40	3.79	270.37	0.00	0.00	0.00	0.00	0.00	0.00	10.87	10.42
243.00	1350.00	0.84	31.76	0.55	0.65	4.46	9.40	3.93	272.21	0.00	0.00	0.00	0.00	0.00	0.00	10.82	10.42
262.00	1567.00	1.02	34.45	0.56	0.66	4.60	9.40	4.07	273.78	0.00	0.00	0.00	0.00	0.00	0.00	10.79	10.42
281.00	1783.00	1.20	36.43	0.57	0.67	4.75	9.40	4.21	275.13	0.00	0.00	0.00	0.00	0.00	0.00	10.77	10.42
300.00	2000.00	1.38	37.83	0.60	0.68	4.92	9.40	4.34	276.28	0.00	0.00	0.00	0.00	0.00	0.00	10.77	10.42

Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

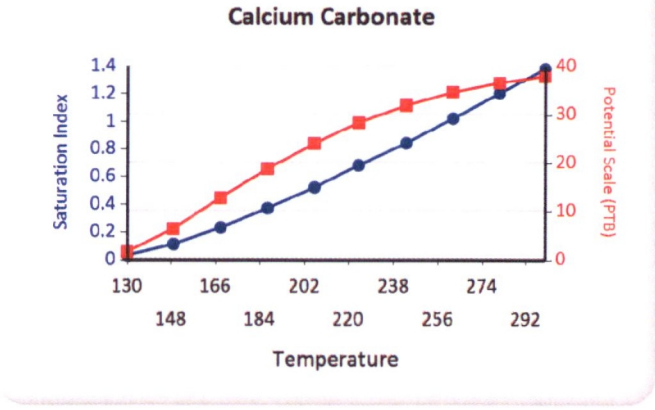
multi-chem
A HALLIBURTON SERVICE

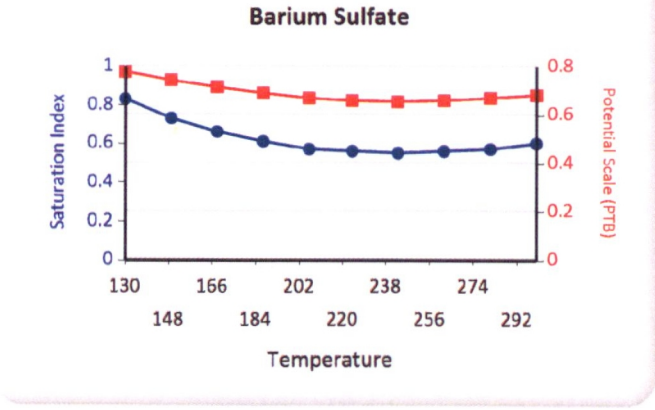
Water Analysis Report

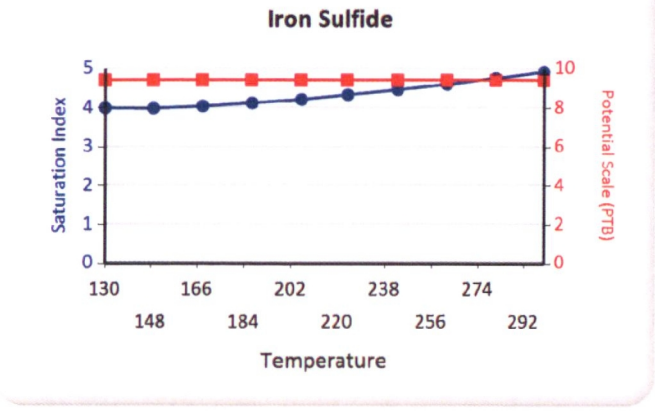
		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
130.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	2.67	204.40	8.71	0.00	0.00	0.00	0.00	0.00	6.38	22.70
149.00	267.00	0.00	0.00	0.00	0.00	0.00	0.00	2.90	207.12	8.32	0.00	0.00	0.00	0.00	0.00	6.99	22.72
168.00	483.00	0.00	0.00	0.00	0.00	0.00	0.00	3.15	209.01	8.02	0.00	0.00	0.00	0.00	0.00	7.82	22.73
187.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	3.39	210.09	7.76	0.00	0.00	0.00	0.00	0.00	8.67	22.73
206.00	917.00	0.00	0.00	0.00	0.00	0.00	0.00	3.61	210.71	7.54	0.00	0.00	0.00	0.00	0.00	9.54	22.73
224.00	1133.00	0.00	0.00	0.00	0.00	0.00	0.00	3.81	211.07	7.34	0.00	0.00	0.00	0.00	0.00	10.43	22.73
243.00	1350.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	211.29	7.18	0.00	0.94	9.59	0.00	0.00	11.33	22.73
262.00	1567.00	0.00	0.00	0.00	0.00	0.00	0.00	4.18	211.43	7.05	0.00	2.00	17.31	0.09	1.01	12.23	22.73
281.00	1783.00	0.00	0.00	0.00	0.00	0.00	0.00	4.35	211.51	6.94	0.00	3.05	21.92	0.75	6.26	13.13	22.73
300.00	2000.00	0.00	0.00	0.00	0.00	0.00	0.00	4.50	211.57	6.85	0.00	4.09	24.14	1.39	9.52	14.03	22.73

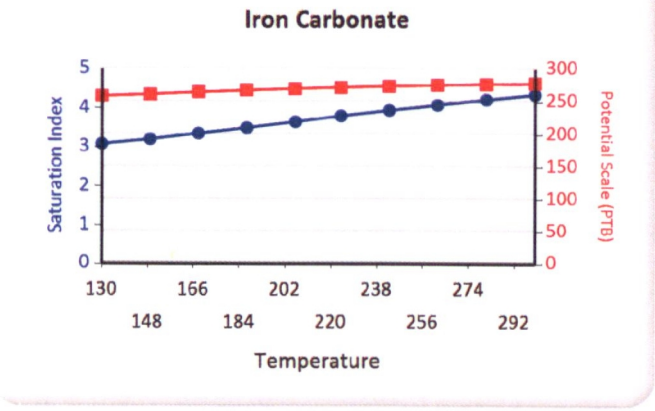
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Lead Sulfide Fe Silicate

These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Lead Sulfide Mg Silicate Ca Mg Silicate Fe Silicate





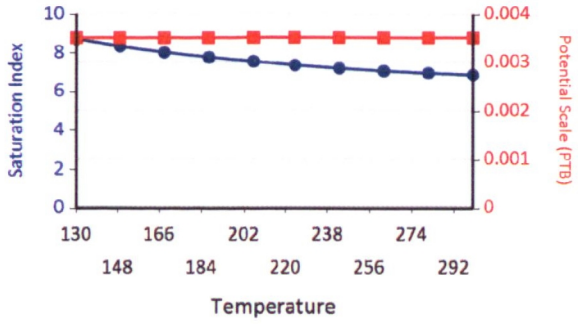




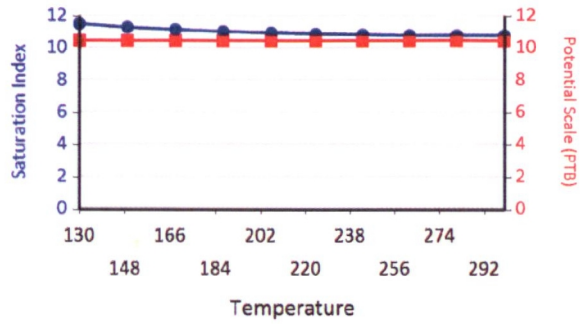
Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

multi-chem®
A HALLIBURTON SERVICE

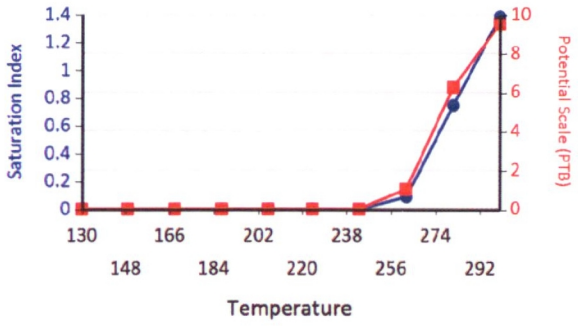
Lead Sulfide



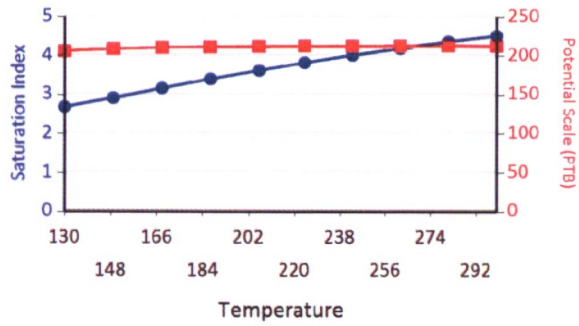
Zinc Sulfide



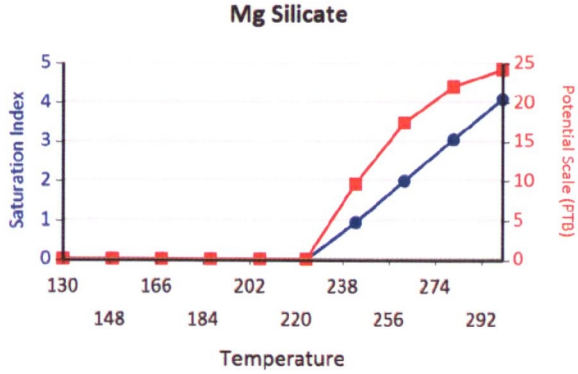
Ca Mg Silicate



Zinc Carbonate

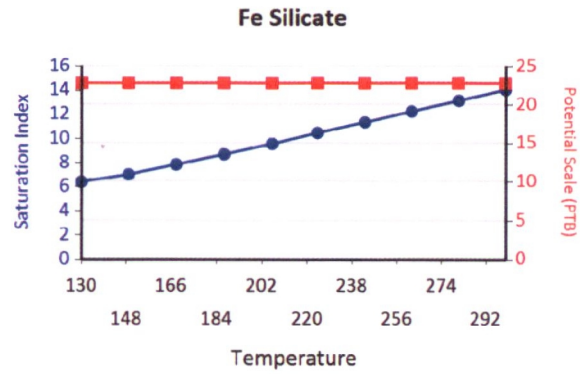


Mg Silicate



Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

multi-chem®
A HALLIBURTON SERVICE



PETROGLYPH EXECUTIVE OFFICES

RECEIVED
JAN 11 2017
Office of Enforcement, Compliance
and Environmental Justice (Water)

January 4, 2017

Gary Wang or Don Breffle
Underground Injection Control Enforcement
U.S. Environmental Protection Agency
Mail Code: 8ENF-UFO
US EPA Region 8
1595 Wyncoop Street
Denver, CO 80202-1129

RE: 5-year Mechanical Integrity Tests
(Ute Tribal 07-15, 15-12, 19-16, 20-14, 29-04)

Mr. Wang/ Mr. Breffle:

Please find enclosed 5-year Mechanical Integrity Tests for the following wells:

- Ute Tribal 07-15 UT20736-07414
- Ute Tribal 15-12 UT20736-04640
- Ute Tribal 19-16 UT20736-07118
- Ute Tribal 20-14 UT20736-04540
- Ute Tribal 29-04 UT20736-06482

If any questions, please reach me at (208) 685-9711.

Best Regards,

Nicole Colby
Manager, Land & Regulatory Compliance

U2 Entered
Date 1/11/17
Initial DB

TAB	GREEN	BLUE	CBI
		2	

Mechanical Integrity Test
Tubing/Casing Annulus Pressure Test

U.S. Environmental Protection Agency
Underground Injection Control Program
1595 Wynkoop Street, Denver, CO 80202

EPA Witness: _____ Date: 12/19/16

Test conducted by: C HANSTEVENSON

Others present: _____

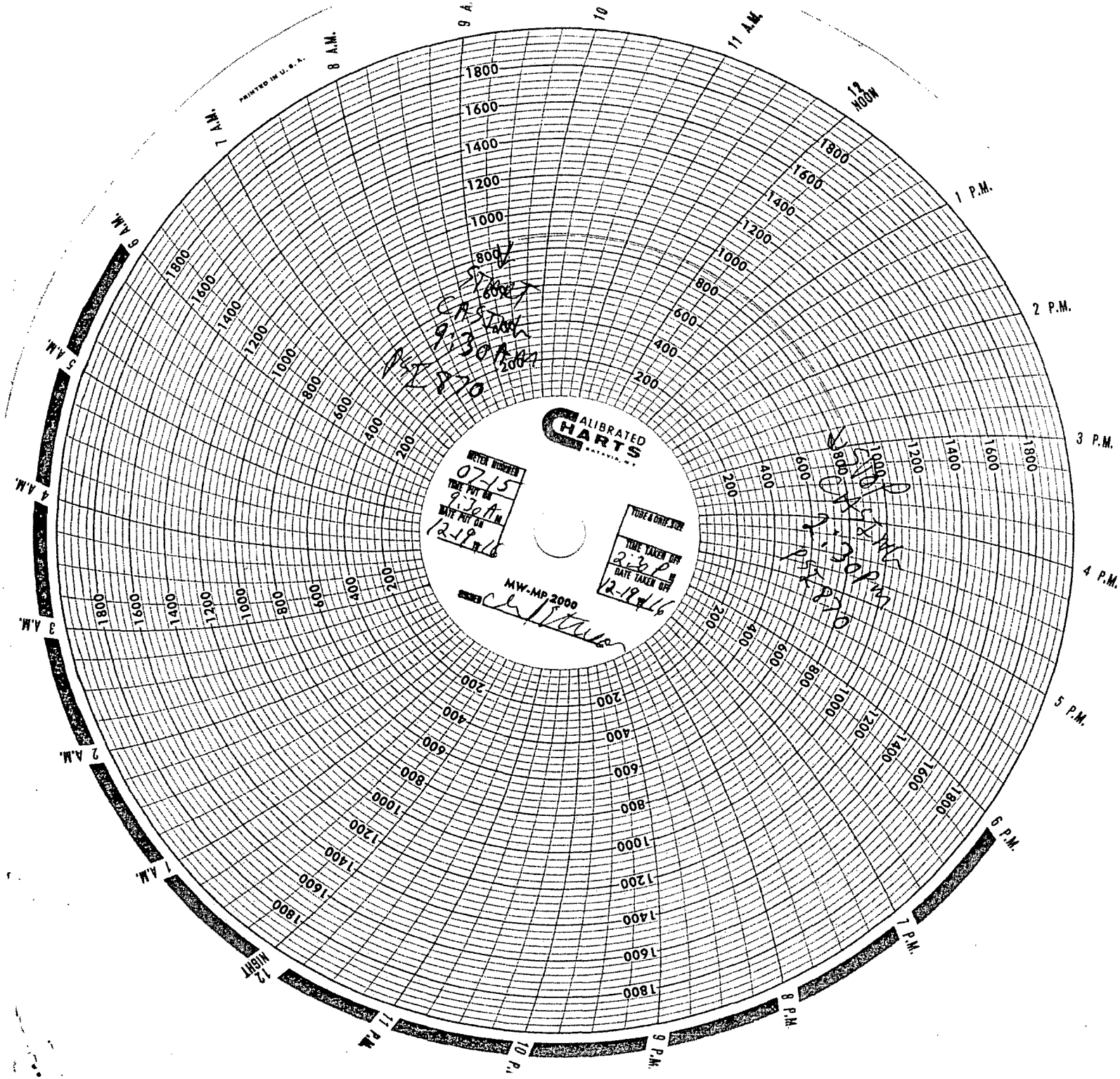
Well Name: 07-15 Type: ER SWD **Status:** AC TA UC
Field: ANTELOPE CREEK
Location: 07-15 Sec: ___ T ___ N / S R ___ E / W **County:** DUCHESNE **State:** UT
Operator: PETROGLYPH ~~ENERGY~~ EWEM
Last MIT: / / **Maximum Allowable Pressure:** _____ **PSIG**

Regularly scheduled test? [X] Yes [ ] No
Initial test for permit? [ ] Yes [ ] No
Test after well rework? [ ] Yes [ ] No

Well injecting during test? If Yes, rate: 35 **bpd**
Pre-test annulus pressure: **psig**

MIT DATA TABLE	Test #1	Test #2	Test #3
TUBING PRESSURE RECORD			
Initial Pressure	1491 psig	psig	psig
End of test pressure	1491 psig	psig	psig
CASING / TUBING ANNULUS PRESSURE RECORD			
0 minutes	870 psig	psig	psig
5 minutes	870 psig	psig	psig
10 minutes	870 psig	psig	psig
15 minutes	870 psig	psig	psig
20 minutes	870 psig	psig	psig
25 minutes	870 psig	psig	psig
30 minutes	870 psig	psig	psig
5 Hours minutes	870 psig	psig	psig
_____ minutes	psig	psig	psig
RESULT	[ ] Pass [ ] Fail	[ ] Pass [ ] Fail	[ ] Pass [ ] Fail

Does the annulus pressure build back up after the test ? If Yes, _____ psig.


CALIBRATED CHARTS
METER NUMBER
0715
TIME PUT ON
9:30 A.M.
DATE PUT ON
12-18-16
TUBE & ORIF. SIZE
TIME TAKEN OFF
2:30 P.M.
DATE TAKEN OFF
12-18-16
MW-MP 2000
PRINTED IN U.S.A.
7 A.M.
8 A.M.
9 A.M.
10
11 A.M.
12 NOON
1 P.M.
2 P.M.
3 P.M.
4 P.M.
5 P.M.
6 P.M.
7 P.M.
8 P.M.
9 P.M.
10 P.M.
11 P.M.
12 MIGHT
1 A.M.
2 A.M.
3 A.M.
4 A.M.
5 A.M.
6 A.M.

OMB No. 2040-0042 Approval Expires 11/30/2014

EPA

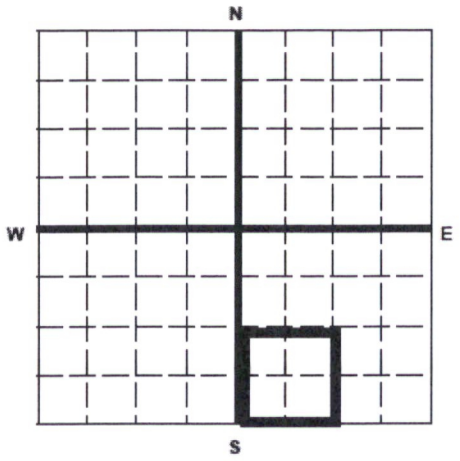
United States Environmental Protection Agency
Washington, DC 20460

ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

Name and Address of Existing Permittee
Petroglyph Operating Company, Inc. 2258
P.O. Box 7608
Boise, Idaho 83709

Name and Address of Surface Owner
Ute Indian Tribe
P.O. Box 70
Ft. Duchesne, Utah, 84026

Locate Well and Outline Unit on Section Plat - 640 Acres



State: Utah
County: Duchesne
Permit Number: UT2736-~~04434~~ 07414

Surface Location Description
___ 1/4 of ___ 1/4 of SW 1/4 of SE 1/4 of Section 7 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 660 ft. frm (N/S) S Line of quarter section
and 1980 ft. from (E/W) E Line of quarter section.

U2 Entered
Date 3/1/16
Initial DB

WELL ACTIVITY
- [ ] Brine Disposal
- [X] Enhanced Recovery
- [ ] Hydrocarbon Storage

TYPE OF PERMIT
- [ ] Individual
- [X] Area

Number of Wells 111

Lease Name: Ute Indian Tribe
Well Number: UTE TRIBAL 07-15

		INJECTION PRESSURE		TOTAL VOLUME INJECTED		TUBING – CASING ANNULUS PRESSURE (OPTIONAL MONITORING)	
MONTH	YEAR	AVERAGE PSIG	MAXIMUM PSIG	BBL	MCF	MINIMUM PSIG	MAXIMUM PSIG
January	15	1333	1340	635		0	0
February	15	1379	1419	798		0	0
March	15	1378	1443	986		0	0
April	15	1376	1427	968		0	0
May	15	1419	1438	1132		0	0
June	15	1409	1440	1044		0	0
July	15	1466	1466	1144		0	0
August	15	1374	1433	815		0	0
September	15	1399	1451	735		0	0
October	15	1467	1505	868		0	0
November	15	1549	1561	936		0	0
December	15	1530	1543	880		0	0

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibliity of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Chad Stevenson, Water Facilities Supervisor		02/08/2016

EPA Form 7520-11 (Rev. 12-11)

GREEN | BLUE | CBI
TAB | | 2 |

Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

multi-chem
A HALLIBURTON SERVICE

Units of Measurement: **Standard**

Water Analysis Report

Production Company:	**PETROGLYPH OPERATING CO INC - EBUS**	Sales Rep:	**James Patry**
Well Name:	**UTE TRIBAL 07-15 INJ, DUCHESNE**	Lab Tech:	**Michele Pike**
Sample Point:	**Well Head**		
Sample Date:	**1/6/2016**		
Sample ID:	**WA-327714**		

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics

Test Date:	1/13/2016
System Temperature 1 (°F):	60
System Pressure 1 (psig):	2000
System Temperature 2 (°F):	180
System Pressure 2 (psig):	50
Calculated Density (g/ml):	1.0008
pH:	7.10
Calculated TDS (mg/L):	5048.89
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	40.00
H_2S in Gas (%):	
H2S in Water (mg/L):	0.00
Tot. SuspendedSolids(mg/L):	
Corrosivity(LanglierSat.Indx)	0.00
Alkalinity:	

Analysis @ Properties in Sample Specifics

Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	1418.69	Chloride (Cl):	2000.00
Potassium (K):	2.08	Sulfate (SO_4):	550.00
Magnesium (Mg):	85.44	Bicarbonate (HCO_3):	732.00
Calcium (Ca):	207.17	Carbonate (CO_3):	
Strontium (Sr):	5.79	Acetic Acid (CH_3COO)	
Barium (Ba):	0.28	Propionic Acid (C_2H_5COO)	
Iron (Fe):	13.61	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	3.07	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.41	Fluoride (F):	
Ammonia NH_3:		Bromine (Br):	
Manganese (Mn):	0.19	Silica (SiO_2):	30.16
Aluminum (Al):	0.19	Calcium Carbonate ($CaCO_3$):	
Lithium (Li):	0.95	Phosphates (PO_4):	3.06
Boron (B):	0.50	Oxygen (O_2):	
Silicon (Si):	14.10		

Notes:

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180.00	50.00	1.05	82.62	0.39	0.10	0.00	0.00	2.00	9.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
167.00	267.00	0.88	69.97	0.40	0.10	0.00	0.00	1.81	9.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153.00	483.00	0.77	61.68	0.43	0.11	0.00	0.00	1.67	9.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140.00	700.00	0.67	53.60	0.47	0.11	0.00	0.00	1.54	9.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
127.00	917.00	0.57	45.83	0.52	0.12	0.00	0.00	1.40	9.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113.00	1133.00	0.48	38.47	0.59	0.12	0.00	0.00	1.27	9.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	1350.00	0.40	31.60	0.66	0.13	0.00	0.00	1.14	9.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87.00	1567.00	0.32	25.29	0.75	0.14	0.00	0.00	1.02	8.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73.00	1783.00	0.25	19.60	0.86	0.14	0.00	0.00	0.89	8.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60.00	2000.00	0.19	14.58	0.99	0.15	0.00	0.00	0.77	7.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

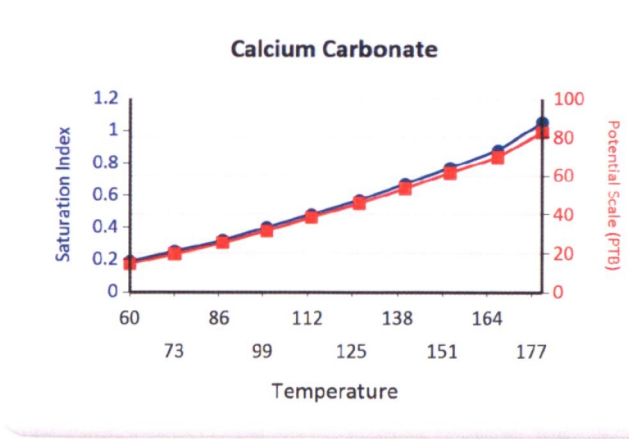
multi-chem®
A HALLIBURTON SERVICE

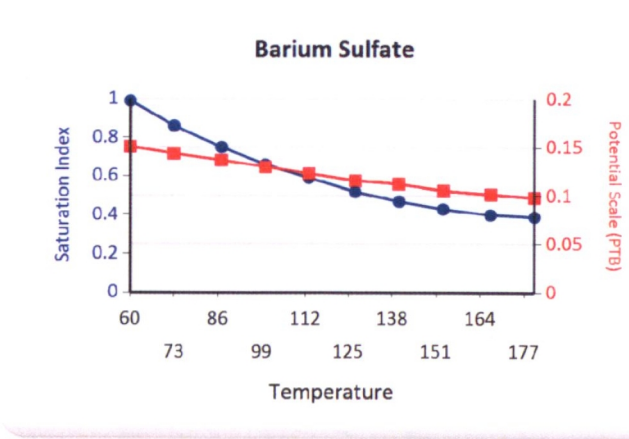
Water Analysis Report

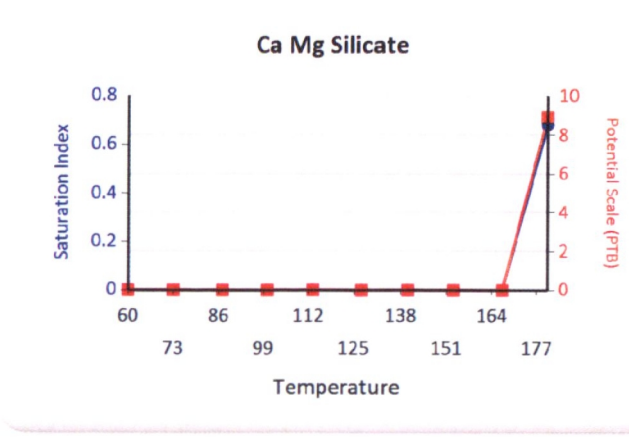
		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	1.36	1.97	0.00	0.00	1.86	24.71	0.68	8.93	6.63	10.46
167.00	267.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13	1.90	0.00	0.00	0.71	8.90	0.00	0.00	5.63	10.32
153.00	483.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	1.82	0.00	0.00	0.00	0.00	0.00	0.00	4.96	10.15
140.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73	1.67	0.00	0.00	0.00	0.00	0.00	0.00	4.31	9.87
127.00	917.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	1.43	0.00	0.00	0.00	0.00	0.00	0.00	3.67	9.45
113.00	1133.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	1.02	0.00	0.00	0.00	0.00	0.00	0.00	3.05	8.81
100.00	1350.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.32	0.00	0.00	0.00	0.00	0.00	0.00	2.44	7.90
87.00	1567.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.85	6.67
73.00	1783.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.28	5.08
60.00	2000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73	3.14

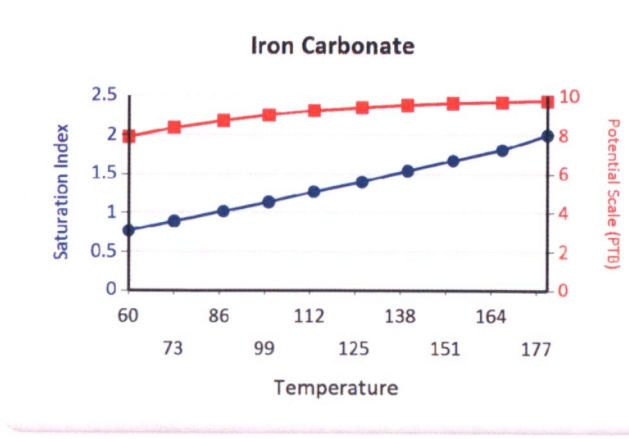
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Carbonate Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Carbonate Fe Silicate



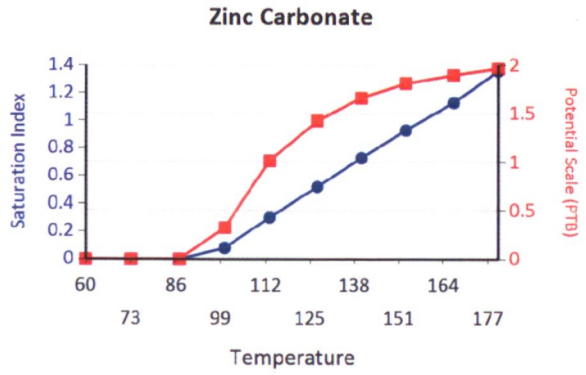


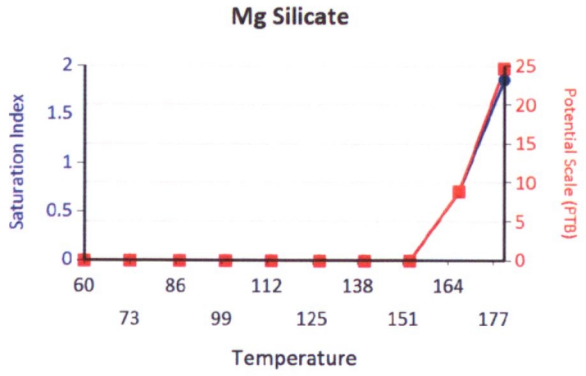


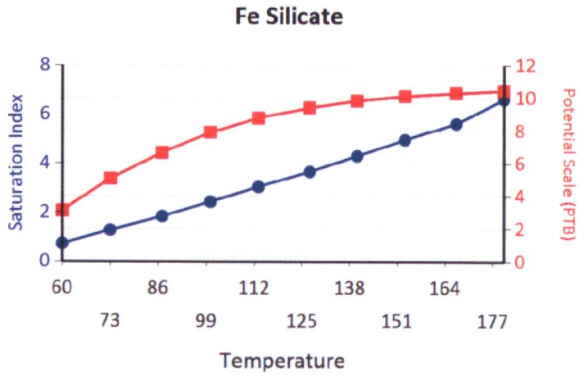


Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

multi-chem®
A HALLIBURTON SERVICE







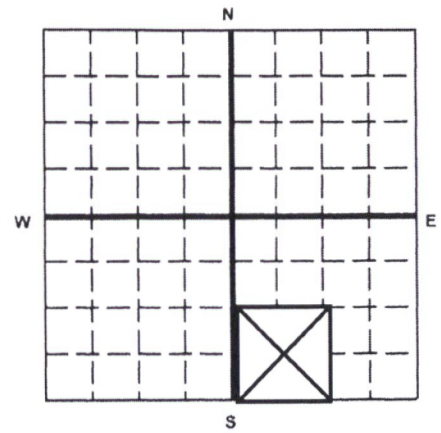
OMB No. 2040-0042 Approval Expires 12/31/2011

United States Environmental Protection Agency
Washington, DC 20460

EPA ANNUAL DISPOSAL/INJECTION WELL MONITORING REPORT

Name and Address of Existing Permittee	Name and Address of Surface Owner
Petroglyph Operating Company, Inc. 2258 P.O. Box 7608 Boise, Idaho 83709	Ute Indian Tribe P.O. Box 70 Ft. Duchesne, Utah 84026

Locate Well and Outline Unit on Section Plat - 640 Acres



State	County	Permit Number
Utah	Duchesne	UT2736-07414

Surface Location Description

___ 1/4 of ___ 1/4 of SW 1/4 of SE 1/4 of Section 7 Township 5S Range 3W

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 660 ft. frm (N/S) S Line of quarter section and 1980 ft. from (E/W) E Line of quarter section.

WELL ACTIVITY
- [ ] Brine Disposal
- [X] Enhanced Recovery
- [ ] Hydrocarbon Storage

TYPE OF PERMIT
- [ ] Individual
- [X] Area

Number of Wells 111

Lease Name Ute Indian Tribe Well Number UTE TRIBAL 07-15

		INJECTION PRESSURE		TOTAL VOLUME INJECTED		TUBING -- CASING ANNULUS PRESSURE (OPTIONAL MONITORING)	
MONTH	YEAR	AVERAGE PSIG	MAXIMUM PSIG	BBL	MCF	MINIMUM PSIG	MAXIMUM PSIG
January	14	1410	1424	1008		0	0
February	14	1410	1440	792		0	0
March	14	1412	1440	893		0	0
April	14	1426	1426	~~925~~	900 inj. Mnthly	0	0
May	14	1427	1430	1015		0	0
June	14	1396	1427	842		0	0
July	14	1348	1402	557		0	0
August	14	1410	1443	788		0	0
September	14	1357	1438	586		0	0
October	14	1370	1403	673		0	0
November	14	1407	1411	776		0	0
December	14	1428	1436	778		0	0

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibliity of fine and imprisonment. (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Chad Stevenson, Water Facilities Supervisor		2/10/2015

EPA Form 7520-11 (Rev. 12-08)

U2 Entered
Date 3/20/15
Initial WW

TAB	GREEN	BLUE	CBI
		2	

Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

multi-chem®
A HALLIBURTON SERVICE

Units of Measurement: **Standard**

Water Analysis Report

Production Company:	**PETROGLYPH OPERATING CO INC - EBUS**	Sales Rep:	**James Patry**
Well Name:	**UTE TRIBAL 07-15 INJ, DUCHESNE**	Lab Tech:	**Gary Winegar**
Sample Point:	**WELLHEAD**		
Sample Date:	**1/7/2015**		
Sample ID:	**WA-297464**		

Scaling potential predicted using ScaleSoftPitzer from Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	1/14/2015
System Temperature 1 (°F):	160
System Pressure 1 (psig):	1300
System Temperature 2 (°F):	80
System Pressure 2 (psig):	15
Calculated Density (g/ml):	1.0045
pH:	8.10
Calculated TDS (mg/L):	10646.59
CO2 in Gas (%):	
Dissolved CO_2 (mg/L)):	0.00
H_2S in Gas (%):	
H2S in Water (mg/L):	5.00

Analysis @ Properties in Sample Specifics			
Cations	*mg/L*	*Anions*	*mg/L*
Sodium (Na):	3395.48	Chloride (Cl):	5000.00
Potassium (K):	49.94	Sulfate (SO_4):	130.00
Magnesium (Mg):	21.81	Bicarbonate (HCO_3):	1957.00
Calcium (Ca):	38.99	Carbonate (CO_3):	
Strontium (Sr):	5.55	Acetic Acid (CH_3COO)	
Barium (Ba):	14.85	Propionic Acid (C_2H_5COO)	
Iron (Fe):	6.58	Butanoic Acid (C_3H_7COO)	
Zinc (Zn):	2.09	Isobutyric Acid ($(CH_3)_2CHCOO$)	
Lead (Pb):	0.00	Fluoride (F):	
Ammonia NH_3:		Bromine (Br):	
Manganese (Mn):	0.12	Silica (SiO_2):	24.18

Notes:
B=5.91 Al=.04 Li=1.84

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
80.00	14.00	1.18	28.90	1.93	8.73	3.46	3.62	2.30	4.76	0.00	0.00	0.00	0.00	0.00	0.00	11.04	1.09
88.00	157.00	1.16	28.41	1.84	8.71	3.36	3.62	2.31	4.76	0.00	0.00	0.00	0.00	0.00	0.00	10.83	1.09
97.00	300.00	1.18	28.71	1.77	8.68	3.30	3.62	2.36	4.76	0.00	0.00	0.00	0.00	0.00	0.00	10.67	1.09
106.00	443.00	1.20	29.03	1.70	8.65	3.26	3.62	2.41	4.76	0.00	0.00	0.00	0.00	0.00	0.00	10.52	1.09
115.00	585.00	1.22	29.35	1.63	8.62	3.22	3.62	2.46	4.77	0.00	0.00	0.00	0.00	0.00	0.00	10.38	1.09
124.00	728.00	1.25	29.68	1.57	8.59	3.19	3.62	2.51	4.77	0.00	0.00	0.00	0.00	0.00	0.00	10.25	1.09
133.00	871.00	1.27	30.01	1.52	8.56	3.16	3.62	2.55	4.77	0.00	0.00	0.00	0.00	0.00	0.00	10.13	1.09
142.00	1014.00	1.30	30.33	1.47	8.52	3.15	3.62	2.60	4.77	0.00	0.00	0.00	0.00	0.00	0.00	10.02	1.09
151.00	1157.00	1.34	30.63	1.43	8.49	3.13	3.62	2.65	4.77	0.00	0.00	0.00	0.00	0.00	0.00	9.91	1.09
160.00	1300.00	1.37	30.94	1.39	8.45	3.13	3.62	2.69	4.77	0.00	0.00	0.00	0.00	0.00	0.00	9.82	1.09

		Hemihydrate CaSO4~0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
80.00	14.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03	1.27	0.00	0.00	0.00	0.00	0.00	0.00	6.92	5.07
88.00	157.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	1.30	0.00	0.00	0.00	0.00	0.00	0.00	6.92	5.07
97.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	1.32	0.00	0.00	0.22	1.51	0.00	0.00	7.16	5.08
106.00	443.00	0.00	0.00	0.00	0.00	0.00	0.00	1.37	1.34	0.00	0.00	0.63	3.93	0.00	0.00	7.41	5.09
115.00	585.00	0.00	0.00	0.00	0.00	0.00	0.00	1.48	1.36	0.00	0.00	1.04	6.39	0.03	0.41	7.67	5.09
124.00	728.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59	1.37	0.00	0.00	1.46	8.87	0.26	1.89	7.94	5.10
133.00	871.00	0.00	0.00	0.00	0.00	0.00	0.00	1.70	1.38	0.00	0.00	1.88	11.37	0.49	3.37	8.22	5.10
142.00	1014.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	1.38	0.00	0.00	2.30	13.83	0.73	4.84	8.50	5.11
151.00	1157.00	0.00	0.00	0.00	0.00	0.00	0.00	1.90	1.39	0.00	0.00	2.73	16.24	0.97	6.26	8.79	5.11
160.00	1300.00	0.00	0.00	0.00	0.00	0.00	0.00	1.99	1.39	0.00	0.00	3.15	18.55	1.21	7.62	9.09	5.11

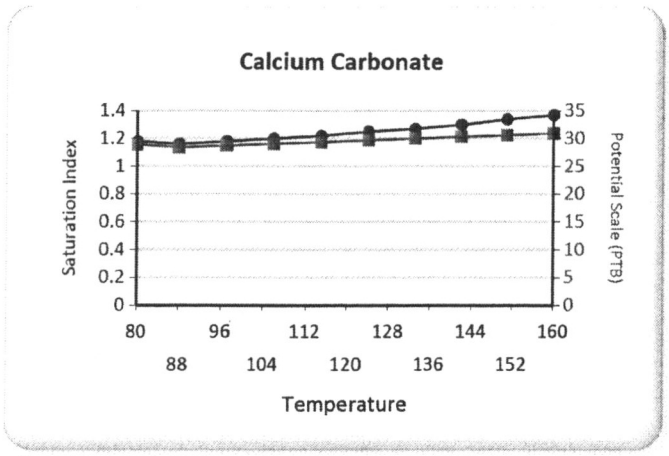
Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

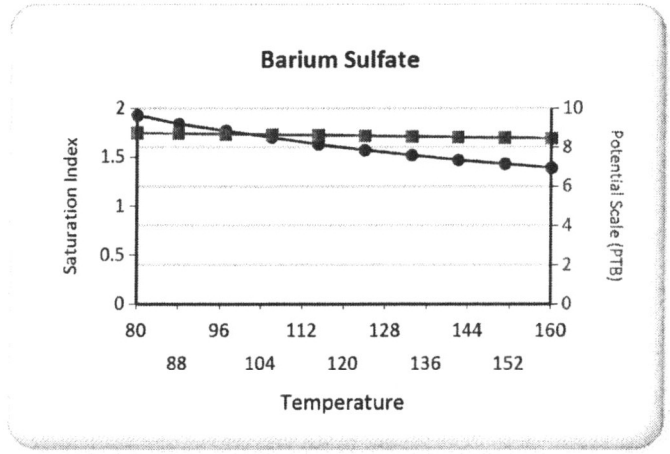
multi-chem®
A HALLIBURTON SERVICE

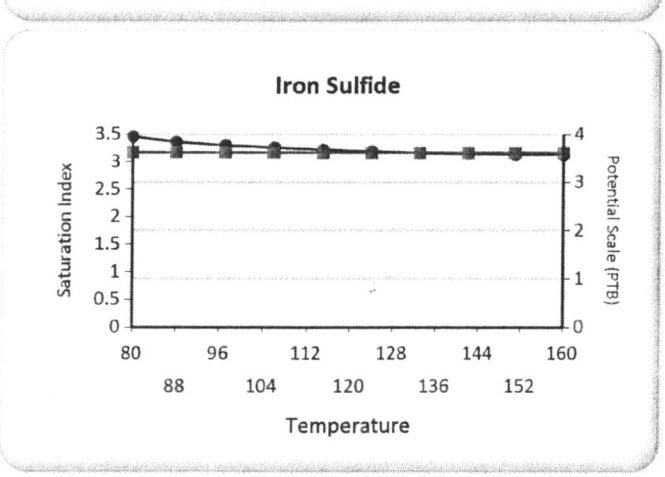
Water Analysis Report

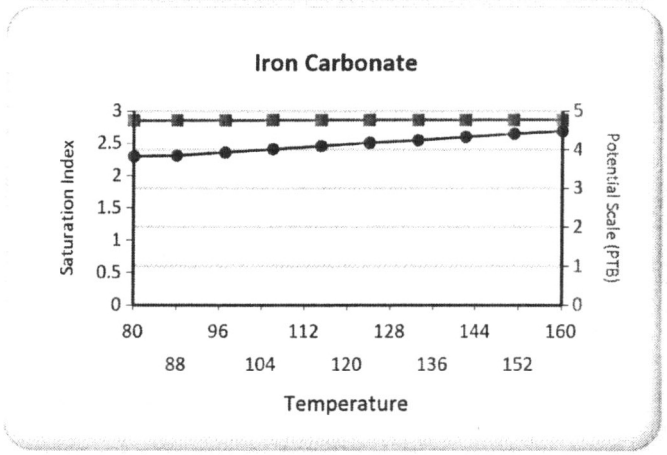
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Fe Silicate

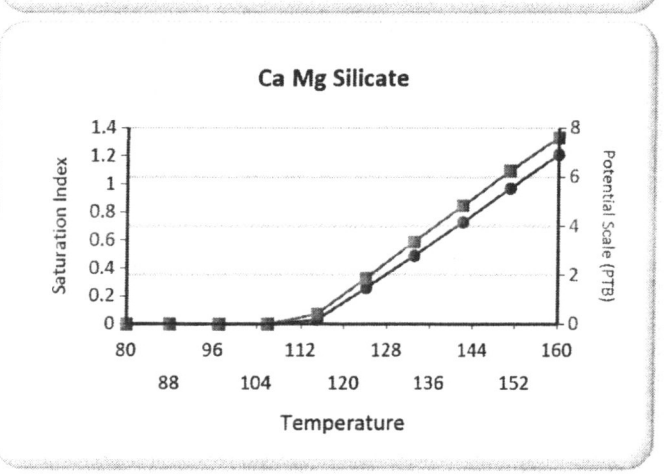
These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Mg Silicate Ca Mg Silicate Fe Silicate

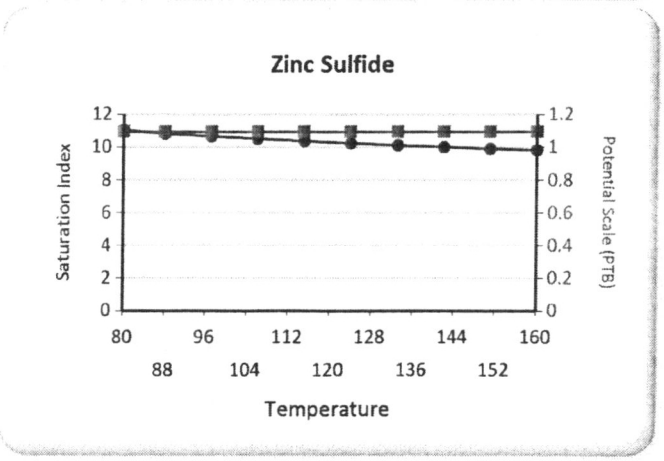








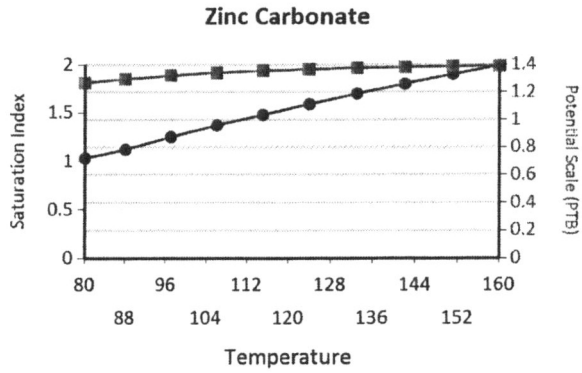


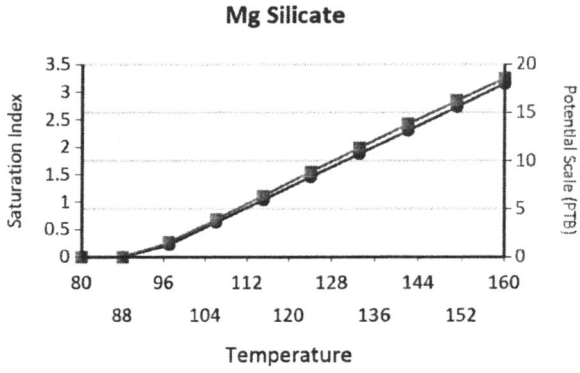


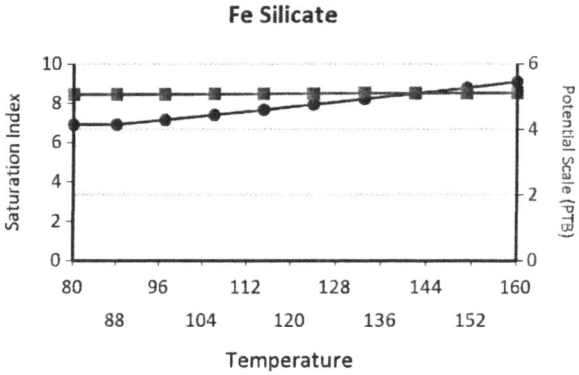
Multi-Chem Analytical Laboratory
1553 East Highway 40
Vernal, UT 84078

multi-chem®
A HALLIBURTON SERVICE

Water Analysis Report







RECEIVED

AUG 03 2015

Office of Enforcement, Compliance
and Environmental Justice (UFO)

July 28, 2015

Don Breffle
Mail Code: 8ENF-UFO
US EPA Region 8
1595 Wynkoop Street
Denver, CO 80202-1129

RE: EPA AREA PERMIT NO. UT2736-07414
Change of maximum surface injection pressure
Ute Tribal 07-15 SWSE Sec. 7-T5S-R3W, Duchesne County, Utah

Mr. Breffle:
On July 17, 2015 Petroglyph Operating Company performed a step rate test on the Ute Tribal 07-15 EPA Permit # UT2736-07414. Petroglyph is requesting that the maximum surface injection pressure be increased from 1480 psig to 1607 psig. Please review the enclosed materials which includes a spreadsheet containing data recorded using our injection monitoring system, and a summary and analysis of the step rate test.

If you need any more information please call at (435) 722-5302.

Sincerely,
Petroglyph Operating Co., Inc.

Rodrigo Jurado
Regulatory Compliance Specialist

Encl: SRT Summary and Analysis, SRT XLS File

Step Rate Test

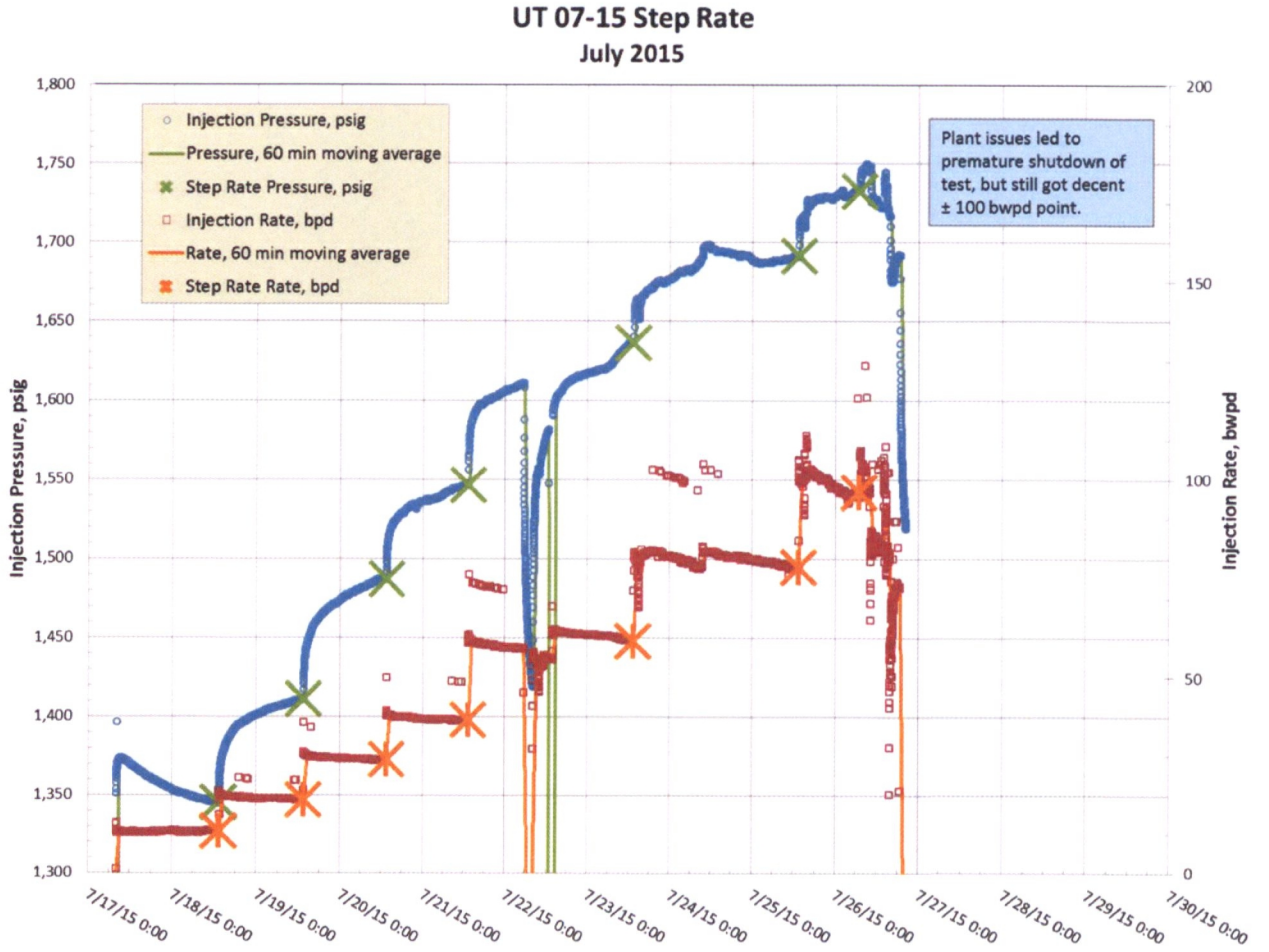
UT 07-15 Injector

Antelope Creek Field
Duchesne County, UT
EPA Permit #: UT2736-07414

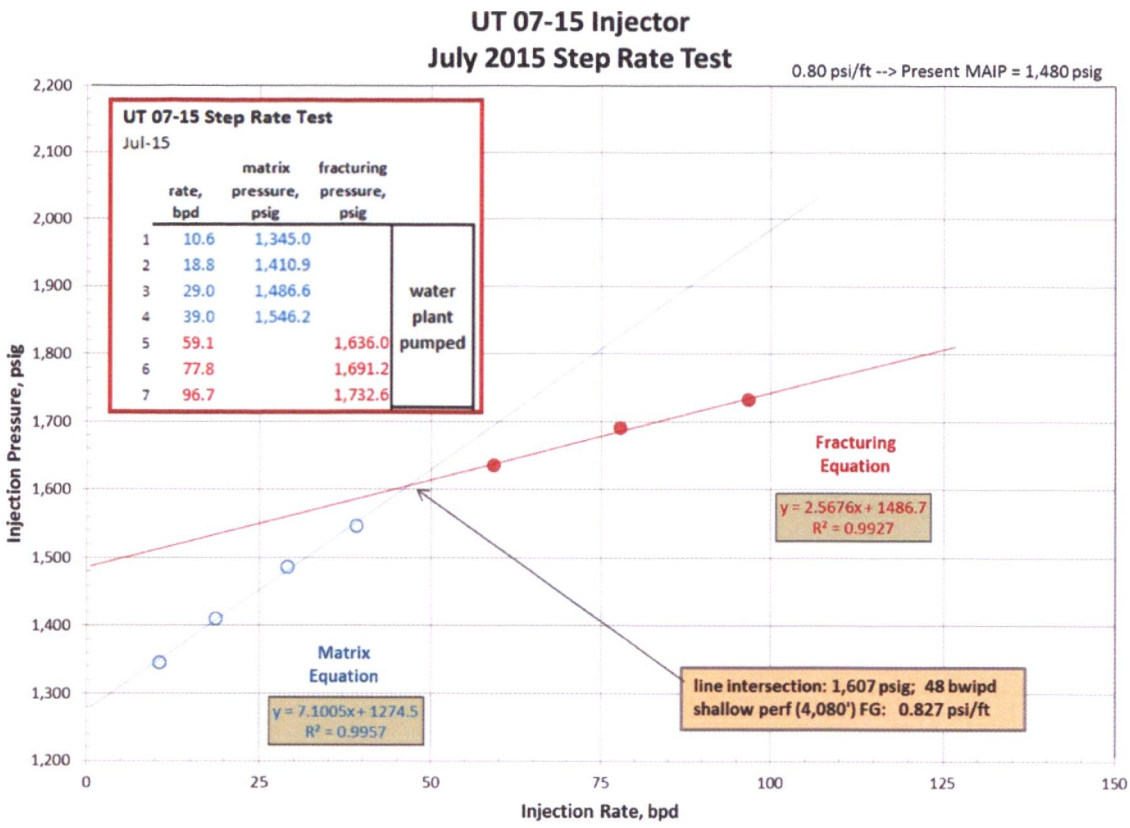
On July 17, 2015, Petroglyph Energy began a step rate test on the UT 07-15 Injector. This well has a Maximum Allowable Injection Pressure (MAIP) of 1,480 psig which was set based on a 0.80 psi/ft fracturing gradient to the top perforation at 4,080'. This step rate was run to determine the actual fracturing gradient.

The step rate test was performed from July 17-July 26, 2015. We have good digital data points with matrix and fracturing lines having $R^2 > 0.99$, indicating a good test. In general, each step was 24 hours in length, although we extended a couple tests to 48 hours, when we had interruptions in the test. Our final fracturing point, while agreeing with the data set, was cut short due to plant problems.

A Cartesian plot of the digitally recorded Halliburton meter data (1 minute increments):



The Step Rate chart:



The resultant step rate plot indicates a fracturing point intersection at:

1,607 psig
48 bwipd
FG: 0.827 psi/ft - to the top perf

Based on this test, we believe the MAIP should be adjusted upwards to 1,607 psig.

A spreadsheet with the data and graphs is enclosed.

Kevin Dickey
VP Operations
Petroglyph Energy, Inc.
960 Broadway Ave, Boise, ID 83706
o. 208.685.7654
m. 208.841.5354

Step Rate Test Analysis

Well name: Ute Tribal 07-15
Permit number: UT20736-07414

Instructions:

1) Enter verified Rate and Pressure data into table

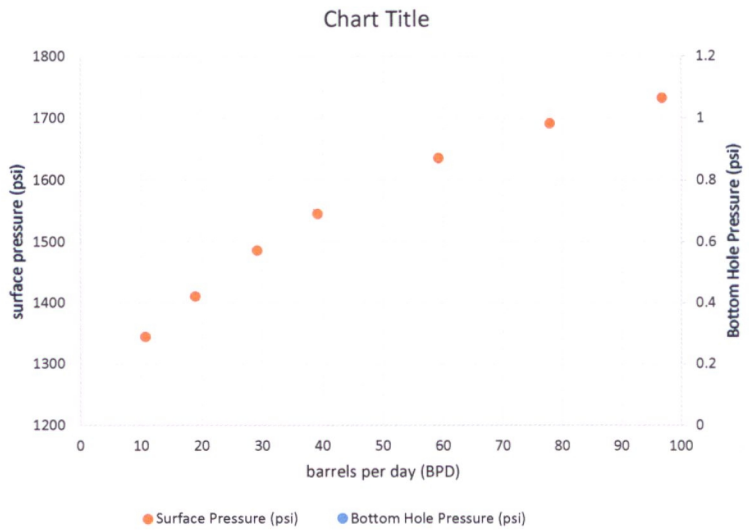
2) Look at scatter plot to left and determine rate step where formation fracture seems to occur.

a) If this point is obvious, enter the m and b values from trendlines on corresponding chart below into table (cell D18) to solve for Pfp.

b) If this point is not obvious, enter the two values for R2 off the charts that represent possible data fits in column L. Look at the R2 summary table to determine which results in the best fit (Sum R2 value closest to 2.0). Then enter the m and b values from the trendlines on table to determine which results in the best fit Sum R2 value

3) Pfp value is automatically entered onto SRT analysis tab. **Enter sg, Depth to top perf, and ISIP on that tab to solve for FG** (and MAIP).

Rate (bpd)	Bottom Hole Pressure (psi)	Surface Pressure (psi)
10.6		1345
18.8		1410.9
29		1486.6
39		1546.2
59.1		1636
77.8		1691.2
96.7		1732.6



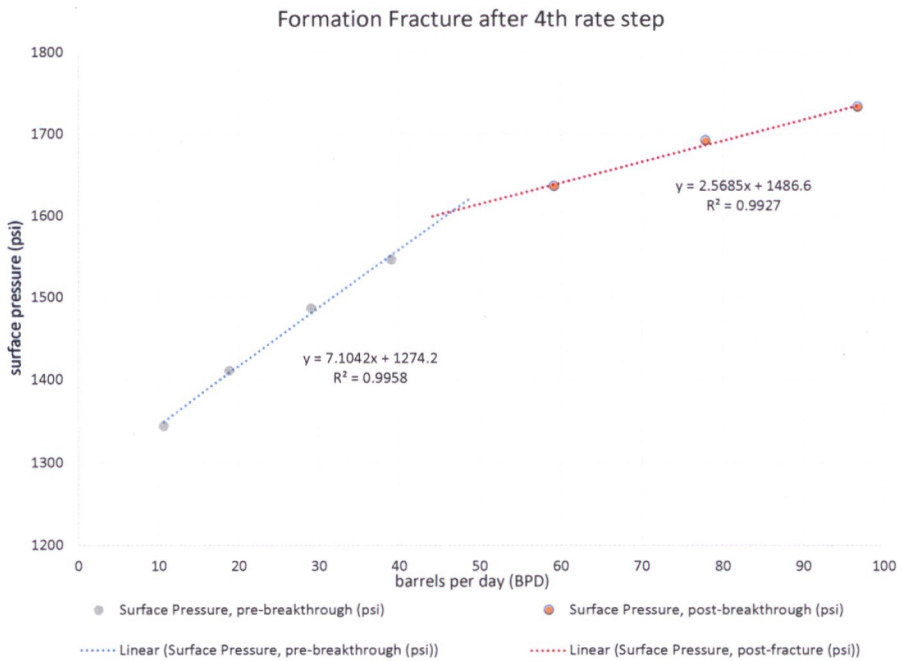
Resulting Formation Parting Pressure

For the graph that results in the best fit (Sum R^2 value closest to 2.0), Enter the following values from the two linear equations to solve for Pfp.
(linear equations in form y = mx + b)

m_1 =	7.1042
b_1 =	1274.2
m_2 =	2.5685
b_2 =	1486.6

P_{fp} = 1606.9 psi

BPD @ P_{fp} based on pre-breakthrough trendline	47.0
BPD @ P_{fp} based on post-breakthrough trendline	47.0



Step Rate Test (SRT) Analysis

Date: 09/16/2015

Operator: **Petroglyph**

Well: **Ute Tribal 07-15**

Permit #: **UT20736-07414**

Surface fracture pressure (P_{fp})	1607	*psi*
Depth to top perf (D_{perf})	4080	*feet*

$$FG = \frac{P_{fp}}{D_{perf}} + 0.433$$

Fracture Gradient (FG)	0.827	*psi/feet*
Specific Gravity (SG)	1.002	*g/cc*

$$MAIP = FG_{\square} - (0.433 * SG]) * D_{inj}$$

Depth to Injection Zone (D_{inj})	3750	*feet*
Maximum Allowable Injection Pressure, calculated to top of injection zone (MAIP)	**1474**	*psi*

Specific Gravity from annual monitoring reports	
FY2014	1.005
FY2013	1.002
FY2012	0.999
FY2011	1.000
FY2010	1.005
FY2009	1.001
FY2008	1.004
FY2007	1.000
AVG	**1.002**

Step Rate Test (SRT) Analysis

Date: 09/16/2015

Operator: **Petroglyph**

Well: **Ute Tribal 07-15**

Permit #: **UT20736-07414**

Surface fracture pressure (P_{fp})	1607	*psi*
Depth to top perf (D_{perf})	4080	*feet*

$$FG = \frac{P_{fp}}{D_{perf}} + 0.433$$

Fracture Gradient (FG)	0.827	*psi/feet*
Specific Gravity (SG)	1.002	*g/cc*

$$MAIP = FG_{\square} - (0.433 * SG]) * D_{inj}$$

Depth to Injection Zone (D_{inj})	4080	*feet*
Maximum Allowable Injection Pressure, calculated to top perforation (MAIP)	**1604**	*psi*

Specific Gravity from annual monitoring reports	
FY2014	1.005
FY2013	1.002
FY2012	0.999
FY2011	1.000
FY2010	1.005
FY2009	1.001
FY2008	1.004
FY2007	1.000
AVG	**1.002**

MAIP CALC FROM 2007

TOP PERF = 4080'

FRAC GRADIENT = 0.8 PSI/Ft (FROM REWORK RECORD?) ? NOT SURE HOW THIS WAS DETERMINED?

S.G = 1.009.

MAIP = [F.G. − (0.433 × S.G)] × DEPTH.

0.433 → INJECTION FLUID PRESSURE GRADIENT?

↳ G_{fw} (PRESSURE EXERTED BY 1 ft of water w/ S.G. of 1.0

WEIGHT GRADIENT OF DISTILLED WATER!

BOTTOM HOLE PARTING PRESSURE (P_{BHP}) = FORMATION FRACTURE PRESSURE (PSI) + (0.433) · S.G. · DEPTH

P_{BHP} = (1607 PSI) + (0.433 · 1.002 · 4080)

= 1607 PSI + 1770.2

= 3377.17

$\frac{3377.17}{4080}$ = 0.828 FRAC GRADIENT!

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
http://www.epa.gov/region08

Ref: 8P-W-GW

JUL 12 2007

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Steve Wall, District Manager
Petroglyph Energy, Inc.
4116 West 3000 So. Ioka Lane
Roosevelt, UT 84066

RE: Authorization to Inject
UIC Permit No. UT20736-00000
Well ID: UT20736-07414
Ute Tribal No. 7-15
Duchesne County, Utah

Dear Mr. Wall:

Thank you for submitting information pertaining to the newly constructed or converted Ute Tribal No. 7-15 enhanced recovery injection well to the Region 8 Ground Water Program office of the Environmental Protection Agency (EPA). The "Prior To Commencing Injection" requirements for the Ute Tribal No. 7-15 injection well required well owner and operator Petroglyph Operating Company, Inc. to submit the following information to the Director:

I. A successful mechanical integrity test (MIT) demonstrating Part I Internal MI,
II. Pore pressure calculation of the proposed injection zone, and
III. Completed EPA Form No. 7520-12.

All required information has been submitted, and has been reviewed and approved by the EPA. Therefore, effective upon your receipt of this letter, Administrative approval hereby is granted for injection into the Ute Tribal No. 7-15 enhanced recovery injection well under the conditions of the Authorization for Additional Well and UIC Area Permit UT20736-00000 as modified.

As of this approval, responsibility for permit compliance and enforcement is transferred to the Region 8 UIC Technical Enforcement Program office. Therefore, please direct all future notification, reporting, monitoring and compliance correspondence to the following address, referencing your well and UIC Permit number on all correspondence regarding this well.

Technical Enforcement Program - UIC
U.S. EPA Region 8, Mail Code 8ENF-UFO
1595 Wynkoop Street
Denver, Colorado 80202-1129

The Director has determined that the maximum allowable surface injection pressure (MAIP) for the Ute Tribal No. 7-15 shall not exceed **1480** psig. New information submitted in the Well Rework Record (dated 11/07/06) was used to recalculate and lower the MAIP value. Please be reminded that it is the responsibility of the owner/operator to be aware of, and to comply with, all conditions of Authorization for Additional Well UT20736-07414 and EPA UIC Area Permit UT20736-00000 and relevant modifications as issued.

If you have any questions regarding this Authorization, please call Linda Bowling of my staff at (303) 312-6254. For questions regarding notification, testing, monitoring, reporting or other Permit requirements, please contact Nathan Wiser of the UIC Technical Enforcement Program by calling (303) 312-6211.

Sincerely,

Steven J. Pratt, P.E., CAPM (inactive)
Director, Ground Water Program

cc:

Curtis Cesspooch, Chairperson
Uintah & Ouray Business Committee
Ute Indian Tribe

Ronald Groves, Councilman
Uintah & Ouray Business Committee
Ute Indian Tribe

Irene Cuch, Vice-Chairperson
Uintah & Ouray Business Committee
Ute Indian Tribe

Steven Cesspooch, Councilman
Uintah & Ouray Business Committee
Ute Indian Tribe

Phillip Chimbraus, Councilman
Uintah & Ouray Business Committee
Ute Indian Tribe

Francis Poowegup, Councilman
Uintah & Ouray Business Committee
Ute Indian Tribe

Chester Mills, Superintendent
BIA - Uintah & Ouray Indian Agency

Mr. Kenneth Smith
Executive Vice President and Chief
Operating Officer
Petroglyph Energy, Inc.

Shawn Chapoose, Director
Land Use Department
Ute Indian Tribe

Gil Hunt
Technical Services Manager
Utah Division of Oil, Gas, and Mining

Fluid Minerals Engineering Office
BLM - Vernal Office

Lynn Becker, Director
Energy and Minerals Department
Ute Indian Tribe

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

JUL 13 2007

Mr. Steve Wall
District Manager
Petroglyph Energy, Inc
4116 West 3000 So. Ioka Lane
Roosevelt, UT 84066

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)* | C. Date of Delivery 7/16/07

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

ROOSEVELT UT 84066
JUL 16 2007
USPS

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number
(Transfer from service label) 7005 1820 0005 4856 3064

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

7005 1820 0005 4856 3064

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

For delivery information visit our website at www.usps.com®

OFFICIAL USE

Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fe	

Postmark Here

Sent To Mr. Steve Wall
Street, Apt. No.; or PO Box No. District Manager
City, State, ZIP+4 Petroglyph Energy, Inc
4116 West 3000 So. Ioka Lane
Roosevelt, UT 84066

PS Form 3800, June 2002 See Reverse for Instructions